

AVIATION WEEK

A MCGRAW-HILL PUBLICATION

July 31, 1950

\$6.00
A YEAR



Francis Fox at Worcester KNOWS!

Worcester, Mass., was one of the first city-owned airports with L-M High Intensity Lighting on all runways. Manager Francis T. Fox and members of the City Airport Commission made a very careful check of lighting and the experience of other airport managers before the decision was made. Captain Fox, a pilot himself, recently told us: "We've had nearly three years of operation now with high intensity lights on all runways. Our experience has convinced us that our choice was a wise one, and our lights have proved their value with better operations in all kinds of weather."



Ask the men who KNOW L-M high intensity runway lighting

Ask airport managers, airline men, and pilots who use and know L-M high intensity runway lighting. They can tell you from their own experiences and observation how important it is to have the 180,000 beam candle power, the freedom from haze and glare, that only L-M lighting offers, with its extremely high intensity and controllable beam. Then ask the L-M Field Engineer for details or write Airport Lighting Division, Line Material Co., East Stroudsburg, Pennsylvania (a McGraw Electric Company Division).



L-M's 180,000 cp. high intensity runway light with the famous controllable beam.



J. E. Hightower at Knoxville KNOWS!

"Here in the Tennessee mountains, we get all kinds of weather," says J. E. Hightower, manager of Knoxville's McGhee Tyson Airport. "And not all of it is good flying weather. So we are very much concerned with the high penetration of our lights, so that we can give the pilot the best possible delineation of the runway. Our experience with the lights has been most gratifying, and an important factor in maintaining a good safety record here."

Vic Dallin at Philadelphia KNOWS!

"Whenever other eastern airports are closed by weather and our Philadelphia International Airport is marginal, all pilots appreciate the great advantage of the controllable-beam high intensity runway lights," says J. Victor Dallin, chief of Philadelphia's Bureau of Aeronautics. "We have had as many as 79 airliners in a single day take refuge here due to weather conditions. We are presently extending our instrument runway another two thousand feet and naturally this extension will be equipped with these lights."

LINE MATERIAL... Airport I

YOU CAN BE **SURE**... IF IT'S
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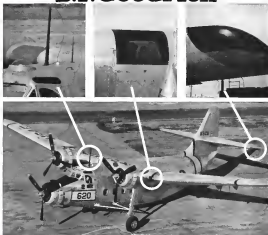
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AVIATION
GAS TURBINES

B.F. Goodrich



Electric blankets keep new Arctic plane from freezing

THIS NEW TRANSPORT, now in production for the military service, has an icy job cut out for it—once service is in the Arctic!

Because of the constant cold-weather operation, Northrop had to design the C-119 "Reliant" system, freezing at all vital points. They called in B. F. Goodrich—the leader in wing, aircraft, BFG engineers came up with the answer—a plastic "blanket" made in three different stages to solve three big wing problems!

The "blanket" is thin, tough rubber with a coat of resistance when running

through it so supply goes fast. It's used on the outer surface (photo top left) to keep ice from forming and clearing the wings to keep off in the wind. On the air scoop (photo top center), it keeps ice from choking off the air supply. Heat furnished by BFG electric rubber on the elevator (photo top right), keeps them from freezing up, because wing curved.

Fitting B. F. Goodrich electric rubber to these three widely-differing shapes proved to be no great problem. It fits curved surfaces like a wing scoop given. What's more, it's the

most efficient way to put the right amount of anti-icing heat on the right spot. It's light-weight and simple, too. You just wire in the electricity, furnished by the plane's regular power supply.

Whenever you have an icing problem, get in touch with The B. F. Goodrich Company, Akron, Ohio.

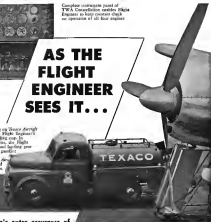
B.F. Goodrich
FIRST IN RUBBER



Complex carburetor part of TWA Conquest engine. Pilots require to keep constant check on operation of all four engines.

AS THE FLIGHT ENGINEER SEES IT...

TWA Conquest takes on Texas Aerojet Engine Oil as you see from flight engineer's viewpoint. Flight engineer, in addition to his flight duties, also flight engineer checks engine and fueling gear during take-off, and runs the engine and oil as properly when cleared. TWA uses Texas Aerojet Engine Oil—has used no other brand for 17 years.



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Team World Airline finds it pays to have a Flight Engineer on each of its Conquests. These trained, experienced technicians assure smoother engine operation, fewer maintenance cases. And say TWA's Flight Engineer will tell you how much help he gets from Texas Aerojet Engine Oil—which the Domestic Division of TWA has been using exclusively for 17 years.

Because it does such an outstanding job, Texas

Aerojet Engine Oil is easily America's most preferred aircraft lubricant. As witness the fact that—

More revenue airline miles in the U.S. are flown with Texas Aerojet Engine Oil than with any other brand.

Another big help for airlines is Texas Lubricants Engineering Service. Call on it for suggestions on storage and handling of lubricants and fuels, lubrication techniques, and the safest, most efficient maintenance practices for your particular operation.

Just call the nearest of the more than 2,000 Texas Wholesale Distributing Places in 48 States, or write: The Texas Company, Aviation Division, 135 East 42nd St., New York 17, N.Y.



TEXACO Lubricants and Fuels
FOR THE AVIATION INDUSTRY

WHO'S WHERE

In the Front Office

Ronald R. Brown, former manager of American DCA Airlines, will become vice president of the American Western Aircraft Co. Brown, who became a lieutenant general in the ATC during World War II, has been vice president since 1951. He served in the ATC during World War II, the Korean War, and the Vietnam War.

Tom Wells, recently released by Pacific Aerospace Corp. to head its domestic and international divisions, has been named president of the company. Wells has been in aviation over a quarter of a century. Most recently he led the team for FAA.

Mrs. Robert Dollé, a Canada's new air traffic controller, has been named director of air traffic and operations at the Canadian Dept. of Transport. He succeeds A. D. Malone, recently appointed to the air transport board.

Changes

Among the manufacturers—E. Eugene Heston has been named director of public relations at Fairchild Aircraft's Fairchild Aircraft Division, including the B-26 Superfortress, including the B-26 Superfortress, Fairchild Engine Division, General Motors Division and the ATC Division. M. N. Galloway has been appointed director of air sales for Armstrong Siddeley Motors, Ltd., of the British Siddeley group. Siddeley group is now C. A. G. Heston.

Roll Oil Co. has named three new division managers in the Pacific coast: F. M. Stewart, Los Angeles; F. L. Edwards, San Francisco; and F. L. Zahner, covering Seattle and Portland divisions. Henry G. Katz, Jr., is now vice manager of Thomas A. Edison, Inc., industrial division.

Among the Airlines—M. G. (Dart) Beall has been appointed chief engineer in Asia for American Airlines. Edward J. Doherty has been named director of public relations for Northwest Airlines. Canon H. Galloway has been named manager—plant and equipment engineering division for Northwest Airlines.

Paul B. Sullivan, president of Brown Boveri Corp. of New York City, recently was named by 21 years of service with the parent corporation, Brown Boveri & Co. Ltd., Baden, Switzerland. G. L. Schindler, Capt., USNR, lately has been appointed technical director of the Bellman Air of Canada. William H. White has been named general manager of the California Air Freight Clinic and Air Freight Inc. to be held in Oakland Aug. 19-20.

Garwood—Donald H. Worlock is newly appointed general sales manager of the Civilian Aircraft Division. He was previously director of the California Air Freight Clinic and Air Freight Inc. to be held in Oakland Aug. 19-20.

INDUSTRY OBSERVER

General Electric, which purchased the poppet valve engine powerplant in the country with its TG-180, moved back into the turboprop field last week, reliable unofficial sources said, by purchasing the large Turboprop engine and its manufacturing rights. The Turboprop, expected to produce 35,000 equivalent shaft hp, will be fitted with no adequate poppet, was developed by Northrop Aircraft Inc.

McDonnell F-48 scout fighter was announced by McDonnell Washington seven last week as probably the "plane most likely to succeed" in the current scout fighter competition, on basis of performance in recent tests at Edwards AFB, Mono, Calif. Senior Air Staff is expected to make the final decision shortly.

Only a few helicopters have been serious thus far in the Korean conflict. Navy Sikorsky HO4S-1s are being used by the Marine service in Korea and for some patrol. A few Air Force Sikorsky H-19s are also understood to be assigned in the theater.

Experiments by a number of leading oil companies seeking an "ideal" lubricant of which would get thicker when heated, and thinner when cooled (forming special process), have met with "failing" difficulties. Apparently the difficulties have caused the project to be dropped.

By product of the recent visit by U.S. aviation company presidents to England was increasing use of a number of international licensing and inter-company agreements. American companies discussed a licensing program on North American T-14 in England, Pratt & Whitney and Rolls-Royce interchange of technical information, and a new Swedish licensing program for Fiat and Whistley.

CAA substantiation is expected soon for testing Ethyl Corp.'s new SB-21 compound in engine plane operations. The compound is designed to promote scavenging and reduce lead buildup in piston engines, is not expected to cause any corrosion difficulties. It was developed with assistance of research at University of Kentucky. Standard Oil Co. of Calif. received an order from Ethyl to make up one million gal. of airplane fuel containing the compound, but CAA refused to approve a trial run of the material in regular passenger airline tests, pending further tests.

Industry reports permit that Boeing is probably the most likely future competitor of the Tebo, OMA, aircraft plant and by Douglas in World War II.

Newest version of the Boeing Stratoflighter four-engine military transport is the C-119 for which USAF has just ordered 388,222 units of spare parts.

NACA reports an impromptu poppet (Aviation Week June 19, p. 12) product important savings in the weight of the poppet and garter. Also produced are shorter and lighter landing gear for planes as a result of the new design trend toward smaller blade angles and very thin blade sections. The higher structural speeds thereby permit possible with these new designs will make it possible to reduce poppet diameter to about half the present size, still getting equivalent power absorption. Paper studies of blade width and new means of eliminating blade vibration cycles are expected in the week to evaluate vibration and fatigue problems at the higher speeds.

Boeing's giant B-52A transport prototype is entering a series of endurance flight tests during which it is expected to fly one hour out of the United Kingdom, but the immediate program calls for no further long distance flights. The three prototype B-52As are planned to follow an assigned test flight, starting London-New York service in 1951 with cruising speed at 15,000 ft. Daily service is planned in such direction, one plane being held in standby.

Evaluation of McDonnell XF-104 Voodoo ground-level supersonic scout fighter has been completed at Edwards AFB. Both models of the fighter (one with, one without afterburner) have been returned to the factory.

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Stabilizes adjustment for exact wing position of a production A-1 fighter.

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Static Load Rating: 30,000 lbs.
Maximum Operating Speed: 7,000 ft/s
Operating Span: 1 inch (see list)
Weight: 20 lbs. (including Radio Motor Drive)

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- (1) Overload Clutch with external adjuster.
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AVIATION CALENDAR

- Aug. 21-1976 National Flying Contest, Grand Prairie, Texas
- Aug. 3-Louis Club Air Meet, San Marcos Airport, California, Chino, Calif.
- Aug. 7-735-Special two-day program on high temperature engines, Massachusetts Institute of Technology, Cambridge, Mass.
- Aug. 9-29-First United States International Trade Fair, Chicago
- Aug. 14-14-National West Coast meeting of the Society of Aerospace Engineers, Hotel Wilshire, Los Angeles
- Aug. 20-Tennessee air program endorsement, Knoxville
- Aug. 19-28-California Air Freight Clinic, sponsored by Calif. Association, Commission and Oakland Chamber of Commerce American Convention, Oakland
- Aug. 21-25-Fourth Annual Air Force Association convention, Hotel Statler, Boston
- Sept. 5-18-Gilberts Flying Display and exhibition, Society of British Aircraft Constructors, Farnborough airfield, England
- Sept. 7-First & Whitney defense applications and maintenance meeting, Pacific Aerospace Corp., Los Angeles, N.Y.
- Sept. 9-40-Third annual convention of the California Wing of the Air Force Association, Anaheim Springs Hotel and Spa near San Bernardino, Calif.
- Sept. 10-14-International Society of America retirement conference and national convention, the Colony, Houston, Tex.
- Sept. 12-14-Conference on ground loads for air transportation, Massachusetts Institute of Technology, Cambridge, Mass.
- Sept. 13-23-TWA's national instrument conference and exhibit, Memorial Auditorium, Buffalo, N.Y.
- Sept. 15-25-1976 national electronic air forum, Edgewater Beach Hotel, Chicago
- Sept. 17-30-Aerometric contact and aircraft engineering display Society of Aerospace Engineers, Hotel Statler, Los Angeles, Calif.
- Sept. 20-26-14th annual convention of the International Northwest Airlines Council, San Diego, Calif.
- Oct. 1-15-1976 conference on airport management and operations, Max Westheimer Field, North Carolina, University of Oakland, Durham, N.C.
- Oct. 16-20-1976 annual general meeting of the International Air Transport Association, Fairmont Hotel, San Francisco
- Oct. 25-26-Night Safety Foundation air and safety seminar, Denver, Colo.
- Oct. 25-27-36th annual aviation conference, sponsored by aviation committee of Transportation Chamber of Commerce

PICTURE CREDITS

11, 21-Billings-BREWSTER News; 24-Norfolk Times; 25-Downey, St. Louis; 26-Albuquerque, N.M.; 27-Edwards, N.M.; 28-World News.

NEWS DIGEST

DOMESTIC

Consolidated Voth's Son, Diego delivers just about half of its 30,000 employees on two time-share shifts Monday through Friday beginning July 27. The stopped-up work schedule will permit Voth's to workweek San Diego's 8-96 modernization program with the 96. West plant's B-50 delivery ahead. The latter went on two time-share shifts on a plantwide basis July 17.

Complete aircraft shipments in air-frame weight, during May 1976 came to 3,551,930 lb., according to the Bureau of Census and GSA. U.S. military customers took 85 percent of the total. May shipments of civilian planes were 377,000 worth \$7.8 million. May average plant employment was up slightly over the previous month-165,175 compared with 164,998.

Northwest Airlines only says some of its 4,000-mile coach fleet to 44 seats or more per mile. NWA's New York statement President Robert E. Grant said that Lockheed delivered 946 planes for an estimated total value of \$85 million during the first six months of 1976. The company with 115 delivered in the same period of 1975 and 1976 delivered in all of last year. Lockheed has reached about \$120,000,000.

American Transport Association reports it has raised \$25,000 of a projected \$100,000 required to fight Civil Aeronautics Board restrictions on scheduled operations. The new regulation operates:



ROBERT J. SMITH, President of Pioneer Air Lines, Dallas, has been nominated by President Truman as vice chairman of the National Security Resources Board. Smith was a colonel in the Air Transport Command during World War II and has since been promoted to brigadier general.

group was engaged in Miami last month.

"Boeing's" Army's two-stage rocket, was successfully fired on its second try at Cocoa, Fla., early last week. It was the first "successfully" fired missile of the armed forces. The missile was a modified Gamma V-2 with a 15-ft., 700 lb. War Capable missile implanted in the modified V-2 nose to 31,000 ft. The War Capable rocket air launched and traveled an estimated 15 mi., reaching speed believed to be 5000 mph. V-2 was shrouded by smoke control blankets of TNA over the rocket. War Capable dropped into the ocean.

FINANCIAL

Lockheed Aircraft reports airplane sales about 30 percent higher for first six months of this year than for same period last year. Boeing, the company's regular, first-year statement President Robert E. Grant said that Lockheed delivered 946 planes for an estimated total value of \$85 million during the first six months of 1976. The company with 115 delivered in the same period of 1975 and 1976 delivered in all of last year. Lockheed has reached about \$120,000,000.

American Airlines declared the regular quarterly dividend of \$ 5.075 per share on the company's \$1-10 cumulative convertible preferred stock payable Sept. 1, 1976, is stockholders at record at the close of business Aug. 16, 1976.

North American Airlines reports an estimated net income of \$5,157,000 after taxes for the period between Oct. 1, 1975/June 30, 1976. Sales and other income for this period amounted to \$91,244,946. Unlabeled sales at June 30, 1976, were \$364,189,568.

General Electric announces a net profit of \$77,448,000 for the company and affiliates for six months ended June 30. This is 66 percent increase over earnings on same period last year. Consolidated net sales billed during first six months of 1976 totaled \$80,910,000.

Glen E. Martin Co. reports a net income of \$572,001 for first six months of this year on total sales deliveries and backlog of \$16,152,791. Under contract orders at the end of 1975's second quarter increased to \$94,412,000, net including some \$27 million in new orders received since June 30.



for faster
construction
of faster planes

Chicago Pneumatic, pioneer in the development of air tools, offers the world's longest line of pneumatic tools and equipment. Air Power Tools, attached and illustrated as Air Tools Catalog No. 164, fourth edition. A copy will be mailed on request.



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PLANNED IS THE WORD... right down to the most minute detail for efficient servicing.

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AVIATION WEEK

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JULY 31, 1959

1951 Airpower Budget: \$5.6 Billion

Upward revision to \$10.5 billion of President Truman's emergency appropriation request submitted in detail to Congress July 26, boosted totals for Air Force and Navy 1951 plane procurement show large estimate of a work gap.

In terms of new military planes, the revised Truman request means that:

Air Force share,	\$4,555,400,000
Navy and Marine Corps share,	\$2,646,528,000
Army share,	\$1,063,947,000
For overall Defense Department activities,	\$240,900,000
Total appropriation request (military funds),	\$88,968,976,000

For Procurement

Total allotted for new planes from emergency request,	\$3,944,600,000
Allocation already agreed upon by Congress for 1951 Air Force and Navy plane procurement,	\$2,298,600,000
Total now budgeted for 1951 military plane procurement,	\$3,643,200,000

Plans Rushed for Big Spending Program

Services charting procurement course; industry set to turn out more planes.

By Alexander McHenry

Air Force and Navy procurement plans last week were busy breaking down into specific contracting requests for \$5.6-billion total now scheduled for 1951 Air Force and Navy aviation procurement. At the Pentagon, Navy building and at Wright Field, technical and calculating machines ground under the huge problems which were posed after them.

Top production planes of U.S. second-line squadrons yielded top scale models of machinery and certain plane types to produce new large-scale production lines for the rapidly increased power requirements laid down July 24 by President Truman.

Foreign Action—Truman's congressional action on the Truman revised request for \$10.5-billion emergency appropriations was expected late last week, as the gaudy at the Korea situation continued.

Analysis of the new request showed the Air Force was due to get \$3.7 billion plus and the Navy \$4.6 billion plus for planes. Air Force was already scheduled to receive \$4.5 billion and the Navy \$2.7 billion in agreed upon in the two Houses of Congress for the 1951 aviation appropriation for the Defense Department.

By the addition of the two allocations would mean a total of \$4.2 billion for Air Force plane procurement, plus \$1.3 billion for Navy aviation procurement. Allocations—here is how the Air Force total of \$4,555,400,000 from the new request would be distributed: Plane procurement, \$2,777,500,000, special procurement, \$460,700,000, acquisition and construction of real property, \$169,700,000, maintenance and operation, \$799,100,000, military personnel, \$167,000,000, salaries, expenses, administration, \$27,600,000.

Only two items on the Navy allocation could be definitely jockeyed out as aviation funds. Construction of aircraft and related procurement, \$646,200,000, and aircraft and facilities, \$149,375,000. But it was likely that a good part of the remaining Navy funds could be used for the way to Navy aviation, directly or indirectly. Navy total allocation was \$2,646,528,000.

Laos Planes—Similarly, no stress on the Army allocations shown could be directly related to aviation procurement, although it was understood that money in hands plane procurement more to be a part of the Army expansion. It was difficult last week for Wash. area observers to assess the qualified aviation procurement estimates in terms

Details of New Aviation Requests

Air Force

Construction of aircraft and related procurement,	\$1,777,500,000
Acquisition and construction of real property,	169,700,000
Special procurement,	460,700,000
Maintenance and operation,	799,100,000
Personnel requirements,	167,000,000
Salaries, expenses, administration,	27,600,000
Total,	\$4,555,400,000

Naval Aviation

Aircraft and facilities,	\$149,375,000
Construction of aircraft and related procurement,	\$646,153,000

EQUIPMENT



CLEANING NWA DC-3 at right has solved "Air Wash" problem. One at left has not.

'Air Wash': Dual Purpose Cleaner

Coe-Bee's time-saving product is reported to be equally effective for removing oxidation and traffic film.

A new type of airplane cleaning agent—Air Wash—is being for recognition among airline operators and manufacturers as a simultaneous remover of oxide and traffic film. These films have heretofore called for two different types of cleaners, according to the maker, Coe-Bee Chemical Co., Los Angeles and St. Louis.

But that isn't all. The manufacturers recommended their new product as eliminating the need for other oxidative cleaners, if it is used at regular 200-hour intervals. This is true even if the aircraft flies in unobscured areas, provided it is maintenance-free at the start.

The manufacturers say that time saved by Air Wash is 12 minutes for a DC-3, 25 for a DC-4 and 15 for a DC-6 or Constellation.

► **No More Polishing**—One large airline overhaul and maintenance base has so completely completed extensive laboratory and service tests on Air Wash. As a result, it expects to eliminate the polishing operation on its airplanes, Coe-Bee reports.

The airline's laboratory tests have shown that its application of Air Wash on 20ST panels left no signs of attack on metal or any corrosive greater after a seven-day open humidity test.

As a result of these tests, the airline was scheduled to start using Air Wash on a regular basis. Each plane was to be Air-Washed every 200 hours, starting at an overhaul condition, with washing intervals in operational schedule period. Coe-Bee considers the 200-hour interval adequate for aircraft operating in non-industrial or oceanic areas.

► **Father Time-Air Wash** West Coast

manufacturers is using Air Wash as a final cleaner on its new military transports as they come out of the gate to remove engine intake grime, dirt, soot and other nonoxidizing soil.

Coe-Bee engineers think their new cleaning agent will displace some of the company's older cleaners which do not possess the dual-purpose qualities.

For example, the oxidation remover produced by the manufacturers, and designated Coe-Bee A-7, is used twice a year by a number of manufacturer operators and the military. It takes more time to apply than the new chemical (approximately 52 minutes for DC-6 at Coe-Bee) and need not be used in comparison with a solvent-type cleaner such as Coe-Bee Aluminex A, used in solvent to water emulsion, or with a Coe-Bee cleaner.

► **Keeping Things Clean**—The company pointed out two important reasons for the constant battle with the dirt, grime, dirt on aircraft.

► **Appearance**—Clean airplanes look off.

► **Corrosion**—Dirt deposits are almost always the signs of corrosion.

Whatever the reason, countless thousands of dollars and man-hours have been spent to keep aluminum aircraft clean, bright and corrosion-free.

According to Coe-Bee, there are three types of deposits: surface oxidation, traffic film and oil, grease and other soluble, loose deposits. Coe-Bee says general maintenance methods do not always take into consideration the types of deposits and their make-up. It claims that the result is excessively high cleaning costs, which often means that less

and less cleaning is performed.

► **Quick and Gentle**—Coe-Bee says trials that chemists through cleaning should begin with the removal of oxide. Too frequently this is not done. Complete removal of aluminum oxide is necessary before any regular maintenance procedures can be initiated.

Methodically for removing oxidation:

► **Hand polishing** with an abrasive material. This is thorough and gives a beautiful luster, but Coe-Bee says this cost is high and the results are not lasting.

► **Chemical brightening**—Coe-Bee states that this method is equally thorough, leaves a natural aluminum color and is effective considerably longer.

Chemicals, which is constantly fighting, leads to further corrosion. The black marks of corrosion can be removed, but the resultant pitting remains for the life of the equipment.

► **Traffic Film**—Probably one of the big cost headaches of aircraft manufacturers is the removal of traffic film, composed of road, manufacturing fumes and general air pollution.

Removal of these deposits is hastened by the high speeds and pressures to which modern aircraft surfaces are subjected.

Coe-Bee says that traffic film will form on aircraft in as little as 100 hours, and effectively seals a "quickie" wash.

► **Washing and Degreasing**—Dirt, dust, oil and other loose surface soils can be easily removed with emulsion cleaners by the spray-on, hand-off method. Regular cleaning is important since rust and corrosion can form under these surface deposits.

During the early days of chemical cleaning, these cleaning phases were handled separately and were not contributed to the overall maintenance schedule, the company says. By washing in conjunction with maintenance programs, fixed-base operators and airlines, Coe-Bee fitted both legs of a cleaning program into regular scheduled overhaul periods, thus reducing maintenance and lay-up time of the aircraft.

TWA and Chicago & Southern provided test facilities—operating on regular schedules, but a scheduled period—to prove this "engineered cleaning procedure."

When originally these different cleaners were required to cope with the three phases of cleaning on a aircraft, Coe-Bee says, constant development has resulted in one cleaner which will do the complete job in most cases, if used on a frequent enough and regular basis.

Raising the Roof ON HIGH ALTITUDE FLIGHT



Developed by Eclipse-Pioneer in cooperation with the Army Medical Lab at Wright Field, the new AF Type D-1 Oxygen Regulator combines the functions of a pressure demand oxygen regulator, flow indicator and pressure gauge—all in one compact, lightweight and easily mounted unit. Designed for normal use up to 45,000 feet, this regulator is suitable for emergency use up to 50,000 feet (in the case of failure of the cabin pressurization equipment). Among its many advantages, the new regulator includes a built-in warning system,

automatic regulation of air-oxygen mix to 100% oxygen at approximately 35,000 feet, automatic pressure breathing which becomes effective at approximately 30,000 feet, and an automatic "Gonzo" breathing feature which assures an unimpeded oxygen flow at all times, despite resistance of long supply lines. Thus the new AF Type D-1 Oxygen Regulator joins the long list of Eclipse-Pioneer developments already in service helping to keep American air power on top.



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- One compact unit combining functions of an oxygen flow indicator, pressure gauge and regulator.
- Completely automatic to 30,000 feet.
- Lightweight—only 4 pounds.
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- Manual emergency flow switch.
- Built-in warning system.
- Pressure relief valve.
- Separate, self-contained unit for each crew member in large planes.

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*These five typical aircraft parts tell a story of Hufford savings. Each was formerly made on equipment commonly found in large plants. With the installation of a Hufford stretch-wrap forming press, parts were switched to the new machine in an effort to improve production and efficiency. The results speak for themselves.

Besides speed, accuracy and economy, numerous other advantages result with the Hufford system. Parts may be formed directly in the FF condition, eliminating heat treatment and refrigeration. Straightening, planishing, drop hammer operations and other corrective procedures are usually unnecessary. Material is uniformly stressed over-all. Yield strength is actually increased, and often ultimate strength is improved. Uniformity of pieces effects savings in hand labor and assembly time. These are typical of the many ways Hufford stretch-wrap forming makes better airplane parts at lower cost.

Whether your forming problem, whether it involves extrusions or skins, investigate Hufford—the only machine with the exclusive stretch-wrap forming principle.

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WING OVER WHEELS SKIN
FORMED ON A HUFFORD STRETCH-WRAP FORMING PRESS. FORMERLY MADE ON A DROPPING HAMMER.



WING OVER WHEELS SKIN
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WING OVER WHEELS SKIN
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NEW AVIATION PRODUCTS

Linear Actuator

A recent arrival on the aircraft equipment counter is a small linear actuator designed for installation in control surfaces or other limited areas. The device is capable of handling loads in some previous loads up to 175 lb.

It can be used for positioning valves, oil cooler shutters, wind trim tabs and similar components. The device is being produced by the Barber-Colman Co., Rockford, Ill., and designed to meet all applicable AN requirements, the firm says.

Electronic Timer

An electronic timer providing automatic control of operation, limit, and sequence timing for "thousands of industrial processes," has been developed by the General Electric Co., Schenectady.

A line of the many uses of the new device are:

- Operation timing to control duration of such processes as heat treating.
- Limit timing to stop conveyor belts of material pile ups.
- Sequence timing with two or more of these units combined to control duration of operation on bearing-grinding machines, centrifuges and other equipment.

GE engineers say the new timer was designed to "fulfill industrial requirements for flexibility of application, accuracy and reliability in operation, low maintenance and simplicity in service use." It is available in three time ranges: 90 to 1.2 seconds, 6 to 12 sec, and 6 to 120 sec.

The device has a detachable backplate which mounts directly on a rigid cabinet or any flat surface. After wires are brought to the back plate and pulled through the frame, it is mounted on the plate by means of four screws. Wiring to the terminal boards and connections of the cover completes the setup.

Spaced between the terminal board and the cover glass adequate space for all hard-wired wiring, including wiring for accessories, the company explains. A dual set of contacts on the front permits control of two operations on the same time schedule.

Life tests indicate the device can perform a million or more operations at three controlled load requirements—1/8 amp, 1/2 amp, 10 amp, and 100 amp.

An important feature of the timer is that the only moving part is a single relay member. This relay acts as a switch. The electronic tube and in the unit is a GE 6J5-A standard type

A recent arrival on the aircraft equipment counter is a small linear actuator designed for installation in control surfaces or other limited areas. The device is capable of handling loads in some previous loads up to 175 lb.

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The actuator has a stroke which is adjustable up to 7 in. Loads are taken by a hardened ground screw and nut with ball thrust bearings, while speed reduction is accomplished through a rubber cushion. The unit is so designed that after it is installed, limit switches are easily accessible for adjustment.

The maker will supply the servo rod of this unit with a bronze bushing eye or with self-aligning and shock-absorbing, bonded-roller assemblies, or, if desired, Barber-Colman actuators are available for two-position or proportioning control.



Self-Locking Nut

A self-locking nut which repeatedly can be applied in either direction, can be and was first used on the self-locking nut of 750 F without losing its locking power has been developed by Security Locking Corp., 3815 N. Kent Ave., Chicago 39.

The firm indicates these characteristics make the nut particularly suitable for use with jet engines. It says that the nut will stay exactly where it has been positioned on a bolt, even when vibration is so violent as to destroy self.

The part consists of a threaded steel nut and a slightly elliptical washer ring. When the locknut is used, the bolt turns the ring instead of the nut itself

a circular shape, causing it to grip the threads under high pressure. Even in period applications will not detach through the bolt, the company claims. Bolt load or stress at loads as high as the nut and not by the locking device.

The actuator is isolated from bearing contact with the nut, functioning solely as a lock. It is prevented from rotating while the nut is by top which it also controls workpiece in the nut body.

The parts are made with National Coarse and National Fine threads in standard sizes from 1/4 to 2 1/2 in.



"Canned" Engines

A new line of metal containers for shipping and storing aircraft engines has been placed on the market. The "cans" shown above are designed for carrying 147 jet engines and are available in two sizes. They are made of 16 in. dia type (Model 550) can be shipped in two tiers on a single railroad flatcar.

The new containers were engineered by A. E. Jones, Inc., 19 Allen St., Buffalo 2, N. Y., and are produced jointly by that firm and Alco Products Division of the American Locomotive Co., Decatur, N. Y.

Alco Products recently made special assemblies for wooden crates, and now Alco Products of General Motors Corp., and General Electric Co. have used its shipping supports for transporting all their jet engines.

The new line of metal containers is designed "to completely protect aircraft engines and its supporting structure against the most extreme conditions encountered in handling, shipping, and storing in all parts of the world."

Containers for jet engines all are designed for horizontal handling, while those for radial reciprocating engines are vertically mounted. The firm reports that about 700 containers for shipping 135, 135 and 147 jet engines were shipped in May. It says prices for these containers compare favorably with the wooden crate assemblies they formerly used.

Hypersonic and Unsteady Flow Studies

NACA reports on two years of aerodynamic tests and calculations.

Hypersonic-speed aerodynamic studies have been one subject of increased research concentration at the National Advisory Committee for Aeronautics. Early results of basic NACA work have been compiled by John V. Becker, chief of unsteady-flow research division at the Langley Laboratory. Lumped in with the hypersonic were the end results of more interesting experiments in the unsteady flow regime. Becker's paper, "Results of Recent Hypersonic and Unsteady Flow Research at the Langley Aeronautical Laboratory," summarizes two years of experiments.

Hypersonic. Tunnel-Chief NACA test for basic hypersonic research is a blowdown type of wind tunnel, capable of test section velocities between Mach 5 and 10 (Aviation Week, Mar. 6, 1958).

Entered in 1945, and developed from a pilot model began that same year, the tunnel first opened in November 1947.

Now, only for a brief heating cycle, but NACA resorted to these devices to increase the testing time.

- A better operation of the test section.
- A cooler downstream of the test section.

- An adjustable round throat.

Current duration of test run varies from 40 to 90 sec, depending on the model support configuration.

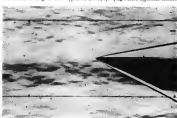
- Shock Tube—As in all unsteady flow research, NACA uses the "shock tube," which is a kind of gas gun's weak form. All it contains is a tube with two chambers separated by a diaphragm. Gas at two different pressures fills the chambers. By bursting the diaphragm, a shock proceeds to the free pressure end of the tube at a low supersonic speed, and a reflection wave leads the other way at sonic speed.

These tubes have been used to study reflection phenomena of shock waves, and to interpret wind tunnel data for the investigation of hypersonic and unsteady flow patterns.

- Flow Visualization—Having produced supersonic flow by any of the usual means, it is convenient to be able to "see" it with some optical technique, such as the schlieren method. NACA



JOHN V. BECKER, chief of unsteady-flow research division, and Charles H. McElroy, action lead in shape at 11-in. hypersonic tunnel, studying NACA hypersonic research.



SCHLIEREN PHOTO of Mach 6.7 shows over control-surface plate shows how boundary layer growth in hypersonic flight makes a flat plate into an aerodynamic wedge.

experience has shown that the usefulness of schlieren techniques reaches a limit at the low pressures associated generally with high Mach numbers in the test section. Example: quartz prisms of about 1/2 in. of recovery with a slender model at Mach 7. By putting the light beam through the test section twice, the limit for schlieren can be extended to about Mach 10 for a 30-atmosphere stagnation pressure. For higher speeds, and for low density aerodynamic research at all speeds, schlieren is quite useless.

So NACA turned to the nitrogen shadowgraph technique suggested to them

by Dr. Joseph Kaplan (Aviation Week, June 23, 1959).

Earlier studies, made independently of NACA, showed that the nitrogen dye retained a long amount of heat, a phenomenon which could be expected to produce some aerodynamic effects in a supersonic nozzle. Recent NACA investigation has found that for their applications, where the dye has a life of only about one second, the temperature rise through the nozzle is only a small fraction of a degree.

Aerodynamic effects of the nitrogen technique then can safely be assumed to be negligible.



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WEAK SHOCK looks to light against shadows. For. Sequence of photos shows how concentrated body flowing shock into...



TIME-SEPARATED looks, probing deep configuration of two turbine disks which fit connection of flow channel.

Currently, engineers therefore a set method to give a qualitative analysis of shock strength, such as it is possible with interferometry. This is because the brightness of the interferogram depends on a number of other factors besides flow density. But even dry, Becker believes, it will be possible to use interferometry to give an indication of shock strength.

Boundary Layer Effects—Solomonically and imperceptibly, effects of liquid, dry layer pressure on pressure distribution are considered as confined to the trailing portion of the aerodynamic surface. Over the leading portion, the boundary layer, for the small range of Reynolds' numbers is too thin to produce any noticeable influence.

But hypersonic effects are another story. Recent calculations indicate that in the 11th hypersonic tunnel at Mach 6.9 shows that boundary layer thickness increases so greatly that the pressure diagram over the forward portion of the surface is greatly altered.

For a flat plate, the displacement thickness of the boundary layer for Mach 7 is almost ten times that for Mach 2. This increase is also associated with a large temperature rise in the layer at high Mach numbers and the corresponding viscosity increase.

The growth of the boundary layer going off on the plate produces the equivalent of a large, unsteady shock. For example, at 0.2 is off of the plate leading edge, the slope of the effective surface is 4.3 deg., equivalent to 4 percent thick wedge.

Supersonic—There are two obvious practical effects of the placational growth of the boundary layer.

- Drag of supersonic flows will be increased because of effective increase in thickness ratio.
- Leading edge control device design becomes will be altered fundamentally.
- Shock Clock—One of the shock tube has been primarily concerned with the development of adequate pressure measurement equipment. Having developed the instrumentation, the next step is to check theory and practice.

A conveniently available pressure-measuring crystal can be used in the shock tube for a series of tests planned to obtain temperature histories of the disturbance in the tube. Conditions studied, the only significant variation here over-determined flow history must have the flow time and distance associated with displacement capture.

Pressure Correlation—A significant effect can be the shock tube of a loss of velocity flow characteristics. Probably the best known of these is the problem of the oscillating shock.

Oscillations of flow may be due to pressure distribution from the viscous portion of the diffuse, to non-boundary distribution in the case of a jet, or to boundary layer interaction with the shock itself, also found in various places.

Take the latter case, the impact. A supersonic jet without an inlet which acts as a diffuser. For high diffuser efficiency, the normal shock has to be positioned under the nozzle inlet, a condition which requires that all the air coming in is reflected by the jet.

If shedding of the flow through the inlet occurs and it might, as a result of turbulent combustion produced by a fuel control system—the normal shock can be forced forward of its intended position. This shifts some of the incoming air around the outside of the cone.

Shock Tube-NACA investigated the characteristics in comparison with some of its recent research where the inlet is to be used as the so-called single cone type. This inlet consists of a central body with a small inlet portion leading into a downstream after body. A conical retractor the control body.

This test results produced pulsations of such violence that the use of the inlet was ruled out. However, research was carried out to determine the reason for pulsations was the separation of flow on the conical surface, resulting from the failure of the boundary layer to pass through the small control disk. When separation and spilling-off occurred, the reduction in flow through the disk produced a drop in back pressure

which was equivalent to reducing the thrusting, and the shock was driven into the inlet again. The process repeated itself, alternately reducing and increasing the shock.

Boundary Interference—These tests also pointed up the effects of static position of the test disk and thrusting, in that they had a controlling influence on the character and frequency of the pulsations.

It should be emphasized that the pulsations produced in this experiment were the result of boundary layer and shock interaction and were not due to laminar flow.

Downstream Influences—When shock oscillations occur because they have been triggered by a downstream disturbance such as a burner igniter, the problem is, at least, to eliminate the pulsations. This is done by eliminating the trigger, in this case the upstream disturbance which travel upstream against the flow.

Dr. Fein, of NACA, proposed a scheme for reducing the strength of these disturbances which generate shock oscillations. His device is an upstream nozzle shaped like a cone, the subsonic flow, channeled into two smaller channels at unequal mass and velocity.

Any disturbance traveling upstream is divided upon contact with this body. In transit through the two channels, one weak shock, it would seem that the effect because of different flow velocities in the two channels. Upon leaving the channels, the shocks tend to spread across the entire cross section, forming a flat combination of two disturbances, each having about half the intensity of the original.

When asked how this scheme works against a flow of increasing velocity and pressure—typical of supersonic flow, NACA expert said that further research was underway on the subject, but it was an interestingly checked.

These studies by NACA constitute another major contribution to the new hypersonic jet—an aerodynamic plane becoming increasingly acquainted to subsonic effects.

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Fiat G.80: First Italian Turbojet Plane

Designed for training; interchangeable nose sections permit use as fighter or photo-reconnaissance craft.

(McGraw-Hill World News)

Italy's first turbojet aircraft prototype has been rolled out of the hangar doors of the Italian aircraft industry. Spurred by licensing agreements with de Havilland (Aviation Week Dec. 19, 1949), Fiat rolled out a large claim for itself in the field of postwar aeroplanes.

The G.80 is its first post-war design. Basic lines of the airplane are clean and conventional, with some evidence of British and American influence.

► **Power Plant.**—Three separate engines make up the G.80 design. The forward section contains the nose wheel and gun, cockpit for the pilot and instructor (both fitted with Martin-Baker ejection seats), some equipment and the air intake for the engine. This section appears to be an integral fuselage and wing center section; the standard parts of the airplane. Here the engine is mounted; the entire wing panel stretched, and the main landing gear wheels hung.

Engine intake and tail surfaces are the third section major components. The design features interchangeable nose sections, which can be quickly interchanged, permitting use of the craft as a single-seat fighter, a night fighter or a photo recon plane.

► **Conventional Wing.**—Planform of the wing is unusual, with a straight leading edge. Two main panels meet at the center section stub wing, which is part of the fuselage structure. Wing area can be increased by the retraction of alternate panels, permitting the training purposes, for which role it is a tandem two-seater.

Structure is two-way with stiffeners, the forward span being at about the quarter-chord line, the other span at about 40 percent.

► **Fuel Supply.**—Tankage is provided in six places: two in the center section, which may 251 gal. total, and two in each outer wing, with a total capacity of 460 gal. Wing tanks, each good for 90 gal., can be fired.

Completely tanked the total fuel capacity is 469 gal.

► **Power Plant.**—Engine for the G.80 is a de Havilland Goshawk 4, which delivers 1700 hp on level static thrust. Although Fiat has license rights from de Havilland for building Goshawk, the chances are that the engine in the prototype is one purchased from de Havilland.

► **Equipment.**—Standard day and night flying instrumentation is installed, with a two-way, 10-channel VHF radio, oxygen and cabin air conditioning.

► **Performance.**—Available performance data for the G.80 appear to be design figures, and they are approximate because the aircraft is not yet built.

Top speed on the deck is given as 540 mph, which is a creditable performance. Maximum range is 540 mi, achieved at an altitude of 28,350 ft, with 2200 lb. of fuel aboard.

► **Some Analysis.**—Although no dimensional data were made available, some reasonable estimates may be obtained. Based on the fuselage diameter necessary to contain a Goshawk 4, the wing span seems to be about 12 ft, and the overall length to about 17 ft. Wing area is around the 225-sq-ft mark, which would make loading 49 psf. The G.80 once more of its base is the Lockheed P-38 configuration, and some of those to previous Fiat design projects. The designers have turned out a straightforward, even conventional, yet unusual which has better-than-average performance in the first Italian postwar design plane.

NACA's Icebox

Putting a bullet through an icebox is a cheap and convenient way to produce hypersonic Mach numbers, says the National Advisory Committee for Aeronautics in Tech. Note 1012.

Faced with the problem of finding an inexpensive, expedient technique for exploring hypersonic effects, NACA and the National Bureau of Standards with a refrigerated test chamber.

In use, the test section is cooled with liquid nitrogen. A commercially-available 225 cu ft high-pressure gas storage cylinder, through the test chamber. The resulting shock patterns are photographed, using the spark shadowgraph technique.

Speeds of the order of Mach 7 have been obtained, says NACA.

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Relative Market Action

Listed Aircraft Companies Stock

Company	1992 High	1997 Low	Jan. 11, 1998 Price	Adv. since 1992 Peak
Intel*	37	0	70 1/2	187%
Microsoft*	11	1 1/2	61 1/4	557%
Oracle	36	10	24 1/2	27%
IBM	100	10	100	0%
Veritas* (High)	100	17	100	0%
Compaq	100	10	100	0%
Novell	100	6 1/2	7 1/2	1%
3Com	100	0	1 1/4	1 1/4%
Compaq† (Low)	100	0	10 1/4	10 1/4%
HP	100	11	100	0%
Seagate	40	14	20 1/2	51%
3Com† (Low)	37	0	1 1/4	3 1/4%
Chameleon	37	0	7	18%
Veritas† (Low)	36	0	7	19%

Notes: All adjustments made for each discipline will
 1.1. frequency modified by 1980 and 1990 equations
 2. adjusted for sample selection

Aircraft Shares Advance Sharply

Reaction to Truman's \$10-billion armament request sends plane stocks to their highest level in years.

Aircraft shares have been in the forefront of market advances as the impact of the President's \$10-billion aircraft manufacturing investment and speculative bids.

As a result, market prices for most smallcap equities have risen sharply and are now at their best levels in years.

Unfortunately, aircraft stocks have become identified as "air babies" and, as such, respond quickly to any changes in the military climate. This recent burst of enthusiasm shows little discrimination but has spilled over to the entire aircraft list. Yet, reasoning to be traversed is the allocation of orders to the separate companies and, most important of all, the ability of some companies to translate increased bookings to profitable results sufficient to justify current and projected market conditions.

• **Taxation Factor**—Until the effects of increased taxation upon gross earnings are fully evaluated, a major factor in the aircraft industry's outlook remains undisturbed.

While there has been considerable uncertainty, there are at yet no clear indications as to the exact form of the new tax measure designed to finance the current \$10-billion overall program. Excess profits taxes certainly are indicated. But will they be imposed on retained capital, prior to corporate earnings, or a combination of elements?

This phase must be defined and related to the separate network components before any propagation of earnings can even be assessed.

This much is certain. National policy will debate that there will be no profiteering as a result of the present emergency. Further, responsible industry leaders have long been careful to avoid conditions which would bring forth charges of excessive profit on government contracts.

★ **Equity Reaction**—It is interesting to note how swift equity have reacted to events since the war peaked. For the most part, postwar peaks in market prices were established during 1946. These new highs were sparked by strong seasonal positions built by war work along with optimistic predictions by some observers of a steep coefficient

from shortages in a rising continuing demand for military aircraft, together with the hope of new markets in commercial business. Significantly, these pursuits began, established in 1945 with one exception, around the peak market points for the latest aircraft design.

through 13-advanced extraneous features, a great deflation took place in market prices of all aircraft types. This slide continued to early in 1947 when the bottom was reached for most aircraft equities. (The two exceptions to this trend were Cessna and Martin which sold at \$ and 74 respectively, during 1943.) The general price deflation took most aircraft equities to functionally low levels showing little relation to liquidating values for current assets.

and little regard for minimum earning
requirements.

Defense Necessity.—As the President's Air Policy Commission came into being during 1947, there was a general awareness that something was going to be done for the aircraft industry through the short termcy of working based on national defense requirements. Having very much the same objectives, the Congressional Aviation Policy Board helped foster the more encouraging attitude toward the industry.

These money sparked a market recovery of large proportions which continued well into 1945. New impetus was provided by the increased aircraft appropriations. This impact continued, on a highly additive basis, throughout 1946 and into 1950.

As each individual company demonstrated its ability to generate improved earnings power and to move ahead in outlook, its equity tended to rise above the general industry trend. For this reason, the lack of uniformity in an individual stock price movement became more pronounced than ever before in the recovery that followed from the 1947 lows.

► **Small Millstones**—The accompanying table shows significant underperformance for 14 of the major listed small-cap common stocks.

Cyrenius stands out as the only man which does he has surpassed the market paid, established in the past years or war period. The accomplishment was achieved prior to the Korean incident. In the interim he closed persistent gain, moreover, have matched the earnings record and outlook of the company.

Many market analysts frequently hit into the fallacy of believing that the cause of an asset once sold at a certain peak quotation and is now available at but a fraction of that price. It is very likely to trace a recovery back to its old high. Such a policy simply ignores the fundamentally affecting the industry and individual companies.

• **Yan-Kind Recoveries**—It can be seen from the accompanying table that more aircraft crashes involved sharp increases in the 1949 year-end in comparison with their 1947 base. On the other hand, the greatest relative gains on the whole, have been made in the most basic structure affecting air

The current boom in wheat prices is short, while off-season temporary gains to marginal producers, will leave it suspect in the positions and outlook for all wheat enterprises. As prospects change so does the volatility (prices of wheat) again. Lack of uniformity in price movements will be just a prelude to the future as it has been in the past.

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AIR TRANSPORT

CAB Proposes New Pilot Standards

Airline reaction expected to be cool; ALPA may ask higher pay levels because of stricter requirements.

Pilot in command. At least 1000 hr of the multi-engine transport pilot's total hours would have to be in pilot-in-command, plus at least 100 hr in multi-engine transport pilot-in-command. (The proposed rule would also require that the pilot-in-command have a minimum of 1000 hr of flight time in the transport category.)

Under the three-grade system, the master pilot would be permitted to captain any type of plane, while the first officer would be limited to acting as captain only on planes having a maximum certified takeoff weight of less than 36,000 lb.

CAB tentatively decided that such a change of these grades of pilot-in-command would not be necessary. Nevertheless, it does not consider the issue settled and has also asked for comments and suggestions on this subject.

► **ICAO Standards Compared.** The proposed Civil Air Regulations revision is in line with previous proposals made by the International Civil Aviation Organization. However, in a number of respects, the U.S. standards would be more stringent than the rules being considered by ICAO.

It is believed that over 95 percent of scheduled airline captains and almost as many as 90 percent of nonscheduled airline captains could qualify for the new Second Airline Transport Pilot certificate. If the master category were set up, it is estimated that at least 70 percent of the regular transport pilots could qualify for the top grade. (Under the new rules, operating planes no larger than DC-9s would have no access to need the master certificate.)

Possibly more than half of the scheduled airline pilots could also qualify for Second Airline Transport Pilot certificate. The question is whether the carrier would go to the expense of qualifying any more pilots than necessary for the senior rating.

► **Unsettled Problems.** The proposed rule changes might go far toward boosting the quality of nonscheduled airline pilots. Federal safety officials have been worried about this problem for some time. At present, an 18-year-old pilot with only 200 hr. of solo time in any powered aircraft can qualify for a commercial license and become a pilot.

Noting the criticism on the Air Line Pilot Association has taken an official stand on CAB's proposals. But it is concerned that the changes could have a major effect on existing contracts between the carriers and the union.

► **The Difference.** ALPA would undoubtedly object a substantial pay differential for senior rating as compared with holders of the Airline Transport Pilot certificate. Moreover, some pilots now holding commercial licenses would be required to qualify for Airline Transport Pilot certificate, the same might not happen for the group.

Airline officials, who are generally in large to new regulations, may balk at the CAB pilot proposal. They want flexibility in their own rules and to replace the "bureaucratic tendency" toward requiring operations of personnel.

CAB proposes that all pilot candidates with Airline Transport ratings issued prior to the effective date of the suggested Part 21 revision would expect to be issued a Part 21. On or before that date, each holder of an ATR would be required to exchange his certificate for an "Airline Transport Pilot certificate appropriate to his experience and qualifications as specified in the new rules."

Such pilots would not be required to take any examination. They would be issued the same license as helicopter



CAPITAL DEBUT

The larger DC-9, first to go in commercial operation, will provide faster two-engine service along new Capital Airlines routes. The Washington Atlantic was not to receive the first service from the carrier's fleet of

three new Douglas DC-9s. Capital will fly its first DC-9 on the Boston-Dallas route on or about 230 days. Capital also started operations with first of five new Carvers on Washington-Chicago line.

and fuel volume remained about the same. Operating costs were up \$1,000, 800, and 500 in expenses paying out steadily to overcome a tight decline in general expense.

Both revenue and passenger traffic increases would have been somewhat larger but for the strike of maintenance personnel the last 11 days of March. Australian and New Zealanders remain the main "spice" for the airline. "Spice" is the term used for the airline's mainline and feeder aircraft, although the volume of such business is still only a small part of overall business. Significantly, AA's 50-year-old group is operating revenue over the first six months last year despite a small decline in total revenue.

Nonskeds Seek Larger Pacific Role

Nonscheduled airlines are testing their non-regular C-46s in potentially significant contribution to the trans-Pacific link to Japan.

The independent Air Carrier Conference of Atlanta, Washington, D.C., is already setting its mind on the Pacific coast for such flights under contract to the airlines. These trips are made on a demand basis, many of them being used to feed cargo from eastern U.S. to the West Coast for transshipment by air to the west coast.

But nonskeds think they could be

even more directly useful in increasing the efficiency of the western states. That principle, however, was contrary to the military's policy all regarding all their engine equipment in non-scheduled aircraft as long-range transport operators are concerned.

► Loads Comparison: Boeing C-46s now under contract to the military for the run to the Great Lakes had only about 12,500 lb. loaded in their 18,500-lb. capacity if they operate over the mid-Pacific route via Hawaii if they fly via the Americas before being sent to be involved, they can carry around 18,500 lb.

The nonskeds offer to haul roughly 12,500-lb. loads in their C-46s in the States in the Americas. These high capacity cargo could be put on C-46 non-scheduled flights to Japan. C-46s can operate up to 100 days in a month to the west coast, depending on the route taken, distribution and other factors. But the Shenyang Airways company would only fly two days, then doubling or tripling the same C-46s' usefulness, according to the nonskeds.

► Flights Available: Nonscheduled operators have about 77 C-46s, most of them on lease from the Air Force. Although, the USAF has about 100 C-46s on lease to various airlines, scheduled all cargo service and the companies. Last month 48 USAF C-46s were used in commercial operations.

Regular carriers also hope to handle increased commercial traffic as a result of scheduled airline planes being diverted to the Pacific. Nonskeds are few commercial cargo which would normally have gone from the Pacific Northwest to Alaska by air is moving by boat. They feel C-46s should give them special assignments to operate regularly to handle such business.

Merger Opponents Continue Fight

Opponents of the recently approved Pan American Airways acquisition of American Overseas Airlines are still hoping the courts will reject the merger.

TWA and a group of AOA employees (Dean C. Sparks et al.) fighting the sale have asked the U.S. Circuit of Appeals for the Second Circuit to review the case. Former Civil Aeronautics Board Chairman James M. Lando, representing the AOA employees, can make CAA stand firmly when, as President, TWA's directors, if it were still and approved the merger.

► Authority Questioned: Originally, the Board voted 1 to 2 against the sale, but President Truman overruled the decision. Lando contends CAA's decision did not require White House approval. And at that, he argues, CAA acted

in acting as first order rejecting the merger, since that decision had Presidential approval for a short time.

Franklin, London, declined, even though the President has authority to approve or disapprove transfer of a certificate authorizing foreign air carrier service. He is not supposed to disapprove CAA to make extensive changes in the same pattern as a condition to approving the deal. (By White House decision, CAA not only approved the sale but ordered Pan American to return to Pan and Boeing, and TWA to London and Frankfurt, Germany.)

On top of all this, Lando questioned whether the FAA AOA merger plan was actually in effect when CAA approved its approval. He said the agreement extending the merger deadline was not filed officially with CAA until after the fact had expired.

May Earnings Up

Highly profitable operations during May have given the domestic airlines' 1993 earnings prospects a rosy tinge.

At the end of April, the 36 carriers showed a \$1,318,000 operating loss compared with a \$127,000 deficit in the first four months of 1993. For May 1993, operating profits totaled \$3,454,000, compared with \$3,916,000 at the same month last year.

Result was a \$4,796,000 operating profit for the first five months of 1993, compared with \$3,469,000 in the 1992 period. The domestic airlines' average passenger mileage in May jumped 13 percent over last year.

Idlewild GCA

Over a half-million dollars worth of Civilian projects approved and airport surveillance radar are being installed by CAA at Idlewild National Airport, N.Y.

The installation is reported to be controversial about the middle of September. It is the Type 1 equipment also installed at LaGuardia Field. CAA will furnish free maintenance and life operations personnel. Construction work and cable and duct work will cost \$49,464, with the civil work and installation costing over \$170,000.

Recommend Denial Of Michigan Routes

Applications of three airlines to operate non-stop service between Detroit and Hershock-Highland on Michigan's upper peninsula should be denied, according to Civil Aeronautics Board Executive R. Vernon Johnson. Johnson said that, he argues, CAA acted

in acting as first order rejecting the merger, since that decision had Presidential approval for a short time. Franklin, London, declined, even though the President has authority to approve or disapprove transfer of a certificate authorizing foreign air carrier service. He is not supposed to disapprove CAA to make extensive changes in the same pattern as a condition to approving the deal. (By White House decision, CAA not only approved the sale but ordered Pan American to return to Pan and Boeing, and TWA to London and Frankfurt, Germany.)

On top of all this, Lando questioned whether the FAA AOA merger plan was actually in effect when CAA approved its approval. He said the agreement extending the merger deadline was not filed officially with CAA until after the fact had expired.

SHORTLINES

► American: Is offering maintenance and overhaul services to a cooperative with B & C Leasing, which operates service on the Great Lakes operating in Buffalo and Chicago.

► American Control Air, Inc.: The Miami company has asked CAA for a certificate to carry cargo over two routes between Miami/Chicago and Birmingham, Alabama.

► Capital: Will start to place its first



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56-passenger Constellation in service last week on the Washington-Chicago run.

► **Civil Aeronautics Board**—The disputed agreements between Trans America Airways, Viking Airlines, Delta Airlines, Arrow Airways, Airline Transport Council, Inc., Associated Airways and Air America relating to routes including procedures. The Board will be held open to facilitate negotiations in relation of the routes/airline in the offering of legal regular routes.

► **Continental**—Has replaced business with male flight agents on four local flights to facilitate the handling of in-

coming cargo and mail traffic. Continental flew 15,155 passengers in June, highest since Sept. 1946, and up 12 percent over July, 1949.

► **Eastern**—Has completed to CAB against National Airlines' tariff proposing integration of defense New York-Miami coach service starting Aug. 5.

► **Holland**—Airline—A DC-4 purchased from American Overseas Airlines is being reconditioned by Toss Engineering & Manufacturing Co., Dallas, and will be flown to Europe for sale on the Constellation route between London, Paris, Rome, Athens and Cairo.

► **International Air Transport Association**—

Dr. George F. Baker, Harvard University transportation professor and former CAB vice chairman, will present the annual IATA paper at the association's 10th annual general meeting at San Francisco on Oct. 18. Topic will be "Looking ahead in international transportation."

► **General Sky Freight-CAB** has also been asked to show cause why its letter of regulations as an air freight operator shouldn't be revoked for knowing and valid violations of the Civil Aeronautics Act. Company is alleged to have operated with excessive frequency and irregularity between New York and Miami, between Los Angeles and San Francisco, and between the West Coast and New York.

► **Pack Air Lines**—Has filed a case against the U. S. Postmaster General for his failure to designate one or more of the carrier's St. Louis-Chicago flights schedules as mail routes. Pack also wants CAB to grant it a temporary mail rate. The Board refused to do so after suspension of Pack's service, which began June 21.

► **Revere-CAB** has denied the carrier's request for an exemption to operate between Southern Pine/Packard, N. C., and New York, Washington, Philadelphia and Miami through Oct. 31.

► **Sabena**—Last week planned to hire delivery in New York on two B-47 Model 47 airplanes which will be used for mail pickup and delivery service out of Newark. The request will be delayed to Newark via Sabena cargo plane.

► **Transcon**—Has been authorized to continue carrying construction workers between the U. S. and Okinawa until Aug. 31, but may have to discontinue the route thereafter. CAB indicated these flights, considered since 1947 as a contract service, are actually seasonal caravans. The Board and Northeast Airlines and Pan American serve Okinawa, and that TAC did not provide the need for additional service.

► **Trans-Texas**—The airline's certificate has been extended to authorize service between Fort Stockton, Tex., and El Paso via Fort.

► **TWA**—Has taken delivery on its first two Martin Model 202A transports.

► **United**—Broke all passenger and cargo traffic revenue in first half 1950. Revenue passenger mileage was up more than 3 percent, express 30 percent, freight 15 percent and mail 9 percent over the same period last year.

► **Wiggins Airways**—The New England flight has asked for route extension from Providence, R. I., to New York via New York and Worcester, R. I., and Southamptown/Berkshire and Idip, N. Y., and from Adams-North Adams, Mass., to New York via Pittsfield, Mass., Danvers, Conn., and White Plains, N. Y. Company also wants to combine mail permit or extended for far west. Wiggins operates Constellation 25 to about 20 hours in its Boston-Albany line.

Produce and service companies at certain part of Air Lines route in the west. (United 1949 at 41)

Act 10—Provisional airlines on Pacific mail route runs. (United 1951)

Act 11—Provisional airlines on Pacific mail route runs. (United 1951)

Act 12—Provisional airlines on Pacific mail route runs. (United 1951)

Act 13—Provisional airlines on Pacific mail route runs. (United 1951)

Act 14—Provisional airlines on Pacific mail route runs. (United 1951)

Act 15—Provisional airlines on Pacific mail route runs. (United 1951)

Provisional flight Aug. 7. (United 1951 at 41)

Act 16—Provisional airlines on Pacific mail route runs. (United 1951)

Act 17—Provisional airlines on Pacific mail route runs. (United 1951)

Act 18—Provisional airlines on Pacific mail route runs. (United 1951)

Act 19—Provisional airlines on Pacific mail route runs. (United 1951)

Act 20—Provisional airlines on Pacific mail route runs. (United 1951)

Act 21—Provisional airlines on Pacific mail route runs. (United 1951)

Act 22—Provisional airlines on Pacific mail route runs. (United 1951)

CAB SCHEDULE

July 31—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 1—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 2—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 3—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 4—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 5—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 6—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 7—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 8—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 9—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 10—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 11—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 12—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 13—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 14—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 15—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 16—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 17—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 18—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 19—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 20—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

Aug. 21—No flying in accordance of North Atlantic Airlines route schedule. (United 1951)

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EDITORIAL

Overselling the Missile

It's time for another warning on missiles. The public is being dangerously misled by the continuing dribble of government press releases on various and unrelated missile frugs, velocity figures and impressive heights.

The general public impression from this publicity barrage seems to be that push-button warfare is around the corner. Despite five years' time since the war, and a hundred million dollars, it isn't even on paper!

There are a few isolated cases of progress, but in the same way we want space exploration. Progress, if any, has been in some ad hoc order, in spite of woefully inadequate direction from Washington. Confusion in government policy is pathetic. Duplication and overlapping in administration of the agencies involved in missile experimentation and development are so serious that great goals that exist between the various projects. But there is duplication in the projects as well.

Someday soon there must come the inevitable sale and shattering realization as this subject. Otherwise, the national security is gravely in danger.

Latest publicity last week described the spectacular firing of Project Scepter of a German V-2, which earned a smaller missile, the Wac. The Wac was lost soon after the V-2 had been launched.

Finally in a constructively critical mood, let's look at this well publicized missile realistically. Why is it, five years after the close of the war with Germany, that we are still firing German V-2 rockets in "honor" to a field as dynamically changing as rockets and missiles. The years should see revolutionary developments and improvements.

As for the Wac, we are informed its payload is about 25 pounds. Most of this has been used for telescoping gear, of course. But even if it wasn't, how much good would this payload be against the Russians, or the Koreans, or anybody? As one of our engineers laughs puts it, 25 pounds is not payload enough to wage war against man. Nor would it accommodate a nuclear warhead, either.

In the public interest, let the following highly important statements—which we avow as responsible public officials anywhere to question or deny—be set down here for the record:

1. The United States does not have any intercontinental missile weapon. We concede that there is one

500-mile subsonic torpedal platform aircraft which could be ready for tests soon. Two years more, under the secret and conceal schedule, might see more ready for service. Two years more could also see a Russian anti-missile rocket ready.

2. The United States does not have any long-range rockets. We have some short-range types—but only in design stages—and one or two that might reach longer distances with the aid of rockets for cruising. But there is nothing in the 5000-mile class. There is nothing even in the 1500-mile class.

3. The United States does not now have in being any secret-tested or secret-accepted missiles of any type or range. What we do have are secreted and ready test vehicles, or limited quantities of missiles that could, with time-consuming rework, become operational. But we do not have any missiles with warheads that are yet on a stand-by basis. Some missiles are actually in or about to go in production, but they are all test models. None is intended to do any serious combat work.

Why, after some 100 million dollars of expenditure is this so?

One reason, we feel, is that Ordnance holds that missiles are merely artillery without guns. So we are getting World War I and World War II artillery thinking.

And the Air Force conceives missiles as merely air planes without the need for pilots. So we get World War I and World War II air force thinking.

The same arguments for diverting the Air Corps from the Army to set up a separate air force now apply to splitting off missile design, experimentation and development from the government administration whose first love and first responsibility are to either artillery or airplanes. The missile is neither.

Somebody should start cleaning up the world confusion, set up a directing agency without the pre-conceived prejudices and theories of any other group, and set to work with open minds and the realistic goal to produce and produce and produce.

That is how the Germans organized their missile forces in Persimonde.

All the production lines in the world having out "bat" missiles will never help us as a race.

—ROBERT H. WOOD

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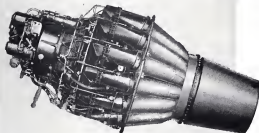
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